

# Work Order ID 56585

March 2, 2010 7:06:03 AM



Page 1

Item ID: D6104-005

Accept



Setup Start



Revision ID:

Stop



Item Name: Round Billet, 17-4

Start Date: 3/02/10 Start Qty: 10.00



Cust Item ID:

Required Date: 3/16/10 Req'd Qty: 10.00

Customer:

Reference:

Run Start



Approvals: Process Plan: CZ

Date: 10/3/12

Tooling:

Date:

Stop



QC:

Date:

SPC (Y/N):

Date:

Sequence ID/  
Work Center ID

Operation  
Description

Set Up/  
Run Hours

Draw  
Number

Draw  
Rev.

Plan  
Code

Accept  
Qty

Reject  
Qty

Reject  
Number

Insp.  
Stamp

Draw Nbr

Revision Nbr

D6104

Rev B

100

0.00



Purchasing

PURCHASING

Memo

0.00

Issue P/O: 11434 ☐ a) Description: S.S round billet ☐ b)  $\varnothing 4.00"$  x  
5.10" long ☐ c) Tolerance on all dimensions are  $+0.030"/-0.000"$  ☐ d) Material:  
17-4PH Stainless steel (Ams 5643 or Aisi 630) ☐ e) One blank makes 2 parts ☐ f)  
Material certification required

CZ 10/3/12 10

110

0.00



Packaging

Receive & Inspect for Damage & Mat'l Certs

Memo

0.00

Ensure material certification is attached

P 10/3/12 (10)

120

0.00



QC

QC6- Inspect dimensions to drawing

Memo

0.00

Ensure Material certification comply to Dwg D6104

amk 10/03/15

10

Quality Control

**Dart Aerospace Ltd**

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

# Work Order ID 56585

March 2, 2010 7:06:03 AM



Page 2

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Date:

Stop



QC:

Date:

SPC (Y/N):

Date:

Sequence ID/  
Work Center ID

Operation  
Description

Set Up/  
Run Hours

Draw  
Number

Draw  
Rev.

Plan  
Code

Accept  
Qty

Reject  
Qty

Reject  
Number

Insp.  
Stamp

130

Identify as per dwg & Stock Location: *MAT*

0.00

*amk 10/03/15*

*10*



Packaging

Memo

0.00

Packaging

140

QC21- Final Inspection - Work Order Release

0.00

*10/03/10*



QC

Memo

0.00

Quality Control

*10-3-14*  
*(10)*

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

# Picklist Print

March 2, 2010 7:06:02 AM

Page 1

Work Order ID: 56585



Parent Item: D6104-005

Parent Item Name: Round Billet, 17-4


Comments: IPP A: ☐ 01.05.08 ☐ New Issue EC

Start Date: 3/02/10

Required Date: 3/16/10

Start Qty: 10.00

Required Qty: 10.00

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Remaining Qty To Pick	Qty Issued	Date Issued	Status
D6104-005P  17-4 SS Roundbar 4.00"OD		Purchased	No			110	Each	0.0000	10.0000			

56585



Rec'd 3/15

(10)

**Dart Aerospace Ltd**

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_  
 Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

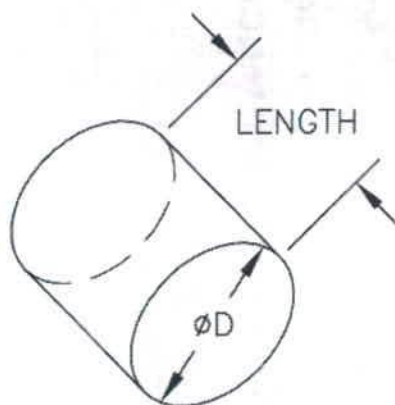


DESIGN FF	DRAWN BY 	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
CHECKED 	APPROVED 	DRAWING NO. D6104	Rev. B SHEET 1 OF 1
DATE 02.11.25		TITLE ROUND BILLET, 17-4	SCALE NTS
A	01.04.10	NEW ISSUE	
B	02.11.25	CLARIFY ALLOY SPEC ADDED D6104-009/-011 REDUCE LENGTH OF BILLETS	

RELEASED

02.11.29

## SPECIFICATION CONTROL DRAWING



CL 10/3/2  
W/D: 56585

MATERIAL: 17-4 PH SS (AMS 5643 OR AISI 630) MIN UTS = 170 KSI (38 HRc)

PURCHASE MATERIAL ACCORDING TO THE FOLLOWING TABLE. SPECIFY ALLOY, DIAMETER x LENGTH (+0.030/-0.000) AS SHOWN.

TOLERANCE ON ALL DIMENSIONS IS +0.030/-0.000.

ALL DIMENSIONS ARE IN INCHES

Part No.	Alloy	D (Diameter)	Length
D6104-001	17-4 PH STAINLESS STEEL	Ø3.00	3.80
D6104-003	17-4 PH STAINLESS STEEL	Ø3.25	3.80
D6104-005	17-4 PH STAINLESS STEEL	Ø4.00	5.10
D6104-007	17-4 PH STAINLESS STEEL	Ø4.50	5.10
D6104-009	17-4 PH STAINLESS STEEL	Ø5.25	4.10
D6104-011	17-4 PH STAINLESS STEEL	Ø6.50	4.10

CL 10/3/15

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W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
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			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

**DART**  
aerospaceDart Aerospace Ltd.  
1270 Aberdeen Street  
Hawkesbury, ON K6A 1K7  
Tel: 613 632 9577  
Fax: 613 632 1053

\*\*\*PO REPRINT\*\*\*

Purchase Order ID PO11434

Purchase Order Date 3/01/10  
PO Print Date 3/02/10

Page Number 1 of 1

## Order From :

VC-MET001

METAUX CASTLE  
A.M. CASTLE & CO. (CANADA) INC. - BOX B9204 PO BOX 9100  
TORONTO, ON M4Y 3A5  
CA

## Contact Name

Vendor Phone 514 694 9575

Vendor Fax 514 695 3281

Vendor Account Nbr

## Buyer

Chantal Lavoie

## Requisition Nbr

Tax Resale Nbr 10127-2607

## Terms

Net 30

## Currency

CAD

## FOB

FAXED  
3/2/10

## Ship To :

DART AEROSPACE LTD

1270 ABERDEEN  
HAWKESBURY, ON K6A 1K7  
CANADA

Line Nbr	Reference Revision ID Vendor Part Number	Description/ Mfg ID	Req Date/ Taxable	Req. Qty/ Unit of Measure	Ship Method	Unit Price
1	M4130NB0.500X03.000	4130 Bar 0.500 x 3.00	3/16/10 Yes	24.00	Yours ppd	\$27.2500
		Special Inst:				
2	D6104-005P	17-4 SS Roundbar 4.00"OD	3/16/10 Yes	10.00 Each	Yours ppd	\$78.0000

## Special Inst:

MATERIAL: AISI 4130N STEEL BAR  
PER MIL-S-6758 OR AMS  
6345/6348/6370/6528

## Special Inst:

AS PER DWG D6104 REV. B  
B56585  
S.S ROUND BILLET  
SIZE: 4.00" X 5.10" LONG  
MATERIAL: 17-4 PH STAINLESS  
STEEL  
AS PER AMS 5643 OR AISI 630  
TOLERANCE ON ALL DIMENSION  
ARE +0.030"/-0.000"

New 24-63 Per 1/3/11

MATERIAL CERTIFICATION  
REQ'D UPON DELIVERY

PO Total:

Change Nbr:

2

Change Date: 3/02/10

No substitution or deviation wi  
consent.  
Certificate of Conformity or M  
Certification required when ap



**Castle Metals®**

A. M. Castle &amp; Co.

**PACKING SLIP**

Page 1 of 1

Pack Slip No:20295310

<b>Ship From:</b> Castle Metals MONTREAL 835-SELKIRK AVENUE POINTE CLAIRE, QUEBEC H9R 3S2		<b>Sold To:</b> DART AEROSPACE LTD 1270 ABERDEEN HAWKESBURY, ON K6A 1K7		<b>Ship To:</b> DART AEROSPACE LTD 1270 ABERDEEN HAWKESBURY, ON K6A 1K7		<b>Deliver To:</b> DART AEROSPACE LTD 1270 ABERDEEN HAWKESBURY, ON K6A 1K7 CA	
<b>Date Shipped</b> 11-MAR-10	<b>F.O.B.</b> ORIGIN	<b>Freight Terms</b> Prepaid		<b>Carrier</b> UPS	<b>BOL No</b> 257053-2	<b>Delivery No</b> 20295310	

**Shipment Details**

Final Destination Branch - MON

<b>Order No</b> 606621	<b>Line No</b> 1	<b>Item No</b> 42464.MO	<b>Description</b> 4.0000.RD.17CR-4NI.STAINLESS.RT.SOL TR.COND A.132.0000-156.0000 CUT TO 5.1 IN ( + .1250/- .0000 IN) - BAND SAW CUTTING SPECIFICATIONS: AISI 630,AMS 5643,ASME SA564,ASTM A564,UNS S17400			
<b>Purchase Order No</b> 11434		<b>Part Number</b>		<b>Ordered Qty</b> 10 PCS	<b>Invoice Qty</b> 10 PCS	<b>Backorder Qty</b>
<b>Details</b>		<b>Heat Number</b> 522893	<b>Mech Id</b>	<b>PCS</b> 10	<b>Width (IN)</b>	<b>Length (IN)</b>
<b>Mill</b>		<b>Shipped Qty (LBS)</b> 93.65				

These commodities/technologies are subject to US Export Administration & US State Dept. Regulations and, if intended for export, were/are exported thereunder. Diversion contrary to US Law is Prohibited.

We hereby certify the material covered by this certification conforms in accordance with the above specifications and has been found to meet the applicable requirements for the material, including any specifications forming a part of the description. Test reports are on file subject to examination. All claims for defective material are waived unless made in writing to A.M. Castle & Co. within 60 days of the shipment. Material cut to the correct size, or material cut by the customer cannot be returned for credit.

This material has been received and inspected by:

Date:

amk 10/03/15



CASTLE TRIMMIS - OLE

MEAT NUMBER

522893

MECHANICAL ID

ITEM CODE

42464

LOT NUMBER

PO NUMBER

22300

RECEIPT DATE

2-8-10

SUPPLIER

Cutakimpu

LCS

COMMENT

APPROVED

107





# Certificate of Test

\*\*\*\*\*  
\* CERTIFICATION \*  
\*\*\*\*\*

HEAT 522893

ORDER 607278/ 02 BOL 0205637 BUNDLE 2006092/1D

02/05/10

SHIP TO:  
A. M. CASTLE & CO.  
26800 MILES ROAD  
216-292-7600  
BEDFORD HEIGHTS

441460000

22300

YOUR ORDER & DATE  
2/05/10 CUST# 0254001 CUST TAG#42464

ITEM DESCRIPTION  
GRADE 17-4 Ship Condition CONDA  
Size 17-4 RND HRART CONDA 4.0000 x 144.000 RL  
Country of Melt: UNITED KINGDOM Country of Mfg.: UNITED STATES  
NAFTA Country of Origin is Country of Melt

No weld repair  
Free of mercury contamination, Free of Radiation Contamination  
No WEEE Relevant Substances; Meets EU Electrical ROHS

Total Bundles 1 Bundle Weight 980

SPECIFICATIONS  
MFG TO FINISHED BAR IN THE USA FROM BILLETS IMPORTED UNITED KINGDOM  
AMS 2303E AMS 5643R  
ASME SA182 E07 A07, A08 & A09 ASME SA564 E07  
ASTM A484 09 ASTM A564 04 Type 630  
DFARS 252.225.7014 6/05 Reduction Ratio 3:1 minimum  
UNS S17400, AISI 630 No weld repair  
Free of Mercury Contaminatio AM Castle 3174-10 R8

MECHANICAL & OTHER TESTS  
Hardness as shipped 294 HB Hardness as tested 409 HB  
Hardness as shipped 031 HRC Hardness as tested ( 44 HRC )  
Grain size 6.0 Tensile strength, KSI (MPa) 200.0 (1379)  
Micro OK 0.2% Yield Strngth, KSI (MPa) 180.0 (1241)  
Intergranular corrosion  
Macro OK Elongation % in 4D 14.0  
Ferrite .0 Reduction of area % 46.0

CHEMICAL COMPOSITION  
Carbon (C) .014 Manganese (Mn) .720  
Phosphorus (P) .021 Sulphur (S) .027  
Silicon (Si) .380 Chromium (Cr) 15.550  
Nickel (Ni) 4.680 Cobalt (Co) .053  
Copper (Cu) 3.300 Moly (Mo) .160  
Nitrogen (N) .022 Columbium (Cb) .260  
Tantalum (Ta) .005  
Columbium/  
Tantalum (Cb+Ta) .265  
Iron (Fe) Balance  
Frequency .000 Severity .000  
Melt Practice EAF  
Refining Practice AOD  
De-long Ferrite

Knowingly & wilfully falsifying or concealing a material act on this form,  
or making false, fictitious or fraudulent statements or representations  
herein could constitute a felony punishable under federal statutes.

We hereby certify that the test results shown in this report are correct and  
accurate as contained in the records of the company and are in compliance  
with the specifications, codes, and standards listed above.

M.F. Marcanio, Quality Manager

*M.F. Marcanio*

